ternal influence may be demonstrated in stages even younger than the pluteus. I am now able to show definite and clear-cut evidence of such influence in the early gastrula stage. This evidence will soon be published in detail, so I shall give it here only in summary.

The material from which this proof is gained was obtained in February, 1911, while I was working at the temporary station established by the department of marine biology of the Carnegie Institution in Montego Bay, Jamaica, British West Indies. The research involved the investigation of the normal development of *Cidaris tribuloides* and of the hybrids obtained by crosses between *Cidaris, Hipponoë* and *Toxopneustes.*

In its normal development *Cidaris* is unlike the modern Echinoids in that the primary mesenchyme is formed late, the cells arising 23–26 hours after the fertilization of the egg, from the inner end of the archenteron, which has pushed, by this time, well into the blastocœle. No mesenchyme cells appear during the blastula stage. In *Toxopneustes,* as is well known, the primary mesenchyme cells arise about 8 hours after the fertilization of the egg, at the posterior pole of the blastula and have passed into the blastocœle before the beginning of the invagination of the archenteron. A similar condition holds for *Hipponoë.*

In the *Cidaris* ♀ × *Toxopneustes* ♂ and the *Cidaris* ♀ × *Hipponoë* ♂ crosses, gastrulation begins in about 23 hours after fertilization, as in the straight fertilized *Cidaris* eggs, the process not being noticeably hastened by the use of the foreign sperm. The primary mesenchyme appears about one hour later, the cells arising around the base of the then very short archenteron, at the region of the lips of the blastopore.

The influence of the foreign sperm is thus clearly shown in the changed site of mesenchyme formation. Furthermore, it appears ontogenetically earlier in the hybrids than in the normal *Cidaris* larvæ.

In calling attention to these matters I do not wish to disparage in any degree the work being done by Shearer, De Morgan and Fuchs and the other British zoologists who have recently begun work in this field. Their work on the later stages is admirable. I do wish to plead against the acceptance of negative evidence as the basis for a positive generalization concerning the early stages in Echinoid crosses. Well-chosen material may give positive evidence.

DAVID H. TENNENT

SOCIETIES AND ACADEMIES

THE ACADEMY OF SCIENCE OF ST. LOUIS

AT the regular meeting of the Academy on February 3 and 17, the following papers were read:

Dr. C. H. Turner:[1] "Apparent Reversal of the Light Responses of the Common Roach."

Dr. LeRoy McMaster: "The Preparation and Properties of the Ammonium Salts of Some Organic Acids."

Dr. Leo Loeb: "Some Biological Aspects of Tumor Investigation."

Dr. Turner discussed a series of experiments conducted with the common roach (*Periplaneta orientalis*) for the purpose of seeing if a negatively phototropic animal could be trained to refuse to enter a specific dark place; and, if that proved possible, for the additional purpose of obtaining an experimental analysis of the behavior.

The electrical punishment method, devised by Professor Yerkes in his study of the dancing mouse, was used.

The speaker stated that he had trained roaches of both sexes and different ages to avoid a specific dark place, and insisted it was equally as logical to interpret his results by concluding that the roach, by means of associated memory, had learned to avoid a specific dark place, as to term its behavior a reversal of negative phototropism.

Professor McMaster described a method of preparing the neutral ammonium salts of monobasic and dibasic organic acids, by dissolving the acids in absolute alcohol or ether and passing dry ammonium gas into the solution. There easily resulted the neutral ammonium salts of succinic, tartaric, ortho- and meta-phthalic, propionic, isobutyric and benzoic acids. Malonic, malic and cinnamic acid salts resulted with difficulty. Analyses showed the compounds to be neutral.[2]

[1] *Biological Bulletin,* Vol. XXIII., 1912, pp. 371–386.

[2] This paper will appear in the April number of the *American Chemical Journal.*

Dr. Loeb pointed out that Weismann's statement that the somatic cells of Metozoa are mortal is not warranted by the facts, the evidence leading merely to the conclusion that somatic cells can usually not reproduce the whole organism. In 1901 Dr. Loeb himself first announced that facts established through experimental tumor investigation made it very probable that tumor cells are potentially immortal, as much so as Protozoa and germ cells, and a few years later he concluded further that, inasmuch as tumor cells are merely ordinary somatic cells living under special conditions, the proof had been supplied, as far as that can be done, that ordinary somatic cells are potentially immortal. He also pointed out that this conclusion could be still further confirmed by serial transplantations of ordinary tissues in animals of various ages. He began such experiments a number of years ago and is continuing this work now under more favorable conditions.

Experimental tumor investigation has furthermore demonstrated that many somatic cells have a potential power to proliferate which appeared almost unthinkable until recent years, one single epithelial or connective tissue cell being potentially able to produce masses of cells which surpass many times the number of cells composing a whole animal of the same species.

Investigations by M. S. Fleisher, in Dr. Loeb's laboratory, fail to show the definite rhythmic changes attributed to tumors by Bashford and Calkins, and Dr. Loeb thinks that if they exist in the case of other somatic tissues, they are not primary attributes of these tissues, but due to secondary mechanisms.

Professor Nipher stated to the Academy that he had recently obtained results confirming his previous conclusion that the strength of a steel magnet depends upon its electric potential.

G. O. JAMES,
Corresponding Secretary

THE ANTHROPOLOGICAL SOCIETY OF WASHINGTON

THE 467th regular meeting of the Anthropological Society of Washington was held in room 43 of the new building of the National Museum at 4:30 P.M., March 18, 1913, the president, Mr. Stetson, in the chair. Dr. John R. Swanton read a paper on "The Creek Confederacy."

After explaining the geographical and linguistic positions of the tribes of the Creek confederacy with the assistance of a map, Dr. Swanton traced the evolution of the confederation from a small nucleus of tribes speaking the Muskogee language to a large association, comprising a number of Hitchiti speaking people, the Alabama, Koasati, some of the Apalachee and Yamasi, part of the Natchez, the Yuchi, and, for a time, some of the Shawnee. He showed that this association was facilitated through the institution of a dual division of towns into white or peace towns and red or war towns, the towns of each division, or "fire," considering each other friends or allies, and having opposing but not warlike relations with the towns of the other "fire." It thus happened that when an outside town or tribe came to be accepted as a "friend" of one of the white or red towns in the confederacy its position with reference to all of the other white and red towns was thus established and it entered into the confederate scheme. The communication of other common features to the new towns also took place, although more slowly. Such features were the "green corn dance" or busk, or perhaps rather the Muskogee form of it, participation in common although irregular councils, and the adoption of Muskogee as the standard language of intercommunication. The actual discontinuance of the proper languages of the various members of the confederacy was, fortunately for the ethnologist, much slower, several of them having persisted down to the present day. Through the progressive adoption of smaller tribes and the practical destruction of some in warfare, a process accelerated by white contact, the Creek confederacy came to be almost the sole representative of eastern Muskhogean culture, and even influenced the culture of the Chickasaw to a marked degree. The great Choctaw body, on the other hand, maintained its cultural independence and was never dominated by the Creeks. In sharp contrast to the Creeks, whose national structure was built up by fitting numerous distantly related tribes into an artificial fraternal scheme, the Choctaw seem to have owed their sense of unity to an actual homogeneity in the Choctaw population, the occupancy of a common area, and the necessity to resist common enemies. They perhaps preserved the simplicity of culture existing among all Muskhogean Indians in times long anterior to the formation of more complicated associations or confederacies.

There was no discussion.

WM. H. BABCOCK,
Secretary